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NAVSEA S-S600-AA-MMA-00-0/TYPE A4

TECHNICAL MANUAL
OPERATION AND MAINTENANCE INSTRUCTIONS

OXYGEN BREATHING APPARATUS
TYPE A4

PART NO. 449763
NSN 2H4240-00-616-2857

Mine Safety Appliances Co.

(Contract number N00104-76-A-0308)

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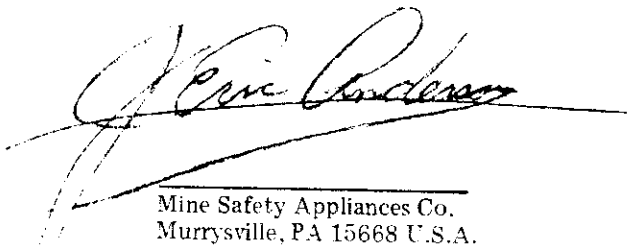
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CHAPTER 1

GENERAL INFORMATION

1-1. INTRODUCTION.

1-2. This manual provides operation and maintenance instructions for the Oxygen Breathing Apparatus (OBA), Type A4, P/N 449763, NSN 2H 4240-00-616-2857, manufactured by Mine Safety Appliances Company, Murrysville, Pa. 15668 U.S.A.

1-3. DESCRIPTION.

1-4. The OBA (see figure 1-1) properly fitted and with a canister, NSN 4240-00-174-1365 in position and operating, will *exclude* external atmosphere and will provide the wearer with a self generating oxygen supply for a total period of 60 minutes. The OBA does not protect wearer

from toxic gases which can be absorbed through the skin. Other protective clothing must be worn for that purpose. The 60-minute period (maximum) includes any time required to enter and leave the contaminated area. For instance if 10 minutes are needed to travel from a safe, fresh air area to a contaminated area, then only 40 minutes may be allowed for work in the contaminated area (10-minutes entering, 40-minutes working, 10-minutes returning — totals 60 minutes).

WARNING

"D" ring on Harness is for Tie Line only. Do not lift a man by this ring and harness assembly.

1-5. EQUIPMENT, ACCESSORIES AND DOCUMENTS SUPPLIED.

1-6. A wrench is supplied as an accessory to remove the valve cap from Speaking Diaphragm on the facepiece assembly. No other equipment or documents are supplied with the OBA. However, a canister, NSN 4240-00-174-1365, is required to provide oxygen when the OBA is donned and in use.

1-7. For personnel having eye glasses, a spectacle kit, P/N 454819 (see figures 1-2 and 1-3), is available for installation of prescription lenses in the facepiece. The spectacle kit should be taken to a medical facility for the installation of the individual prescription lens. Once prescription lenses have been installed, the spectacle kit can only be used by that individual and will be retained as personal glasses.



Figure 1-1. Oxygen Breathing Apparatus, Type A4

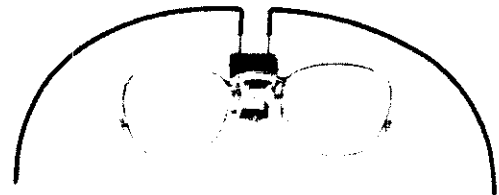


Figure 1-2. Spectacle Kit

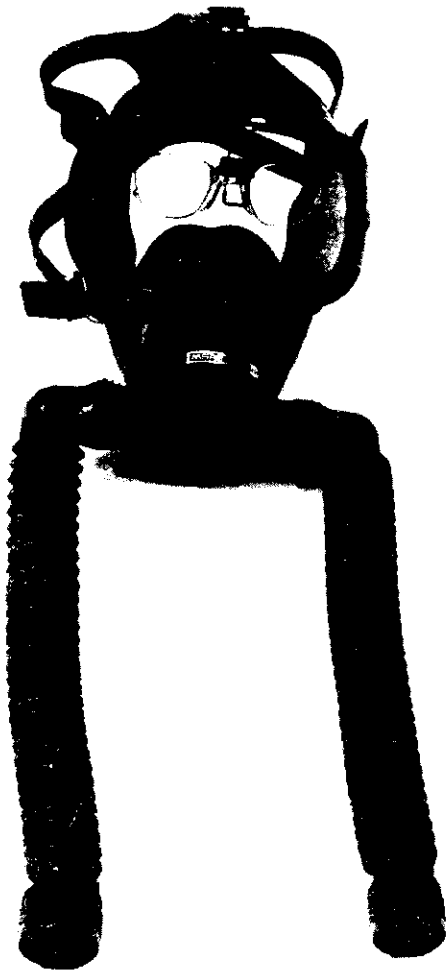


Figure 1-3. Spectacle Kit Installed in Facepiece

1-8. SPECTACLE KIT. The spectacle kit is designed for use by those who must wear corrective lenses. A proper seal cannot be established if the temple bars of spectacles extend through the sealing edge of a full facepiece.

1-9. The Spectacle Kit consists of a retaining spring wire support, a rubber block guide, and one universal-bridge metal-frame spectacle front (S-7 shape, 44-mm lens size) with mounting prongs. Corrective lenses are not included. S-7 is a product designation derived from the "S" in Safety Classification, and "7" for the mm-Dimension variance from height to width of the lens. This shape gives a good field of vision.

CHAPTER 2

OPERATION

2-1. INTRODUCTION.

2-2. The user must don the OBA (see figure 2-1) before entering the contaminated area. During the donning procedure (refer to para 2-11) the timer (1) will have been set, the facepiece (2) adjusted for proper seal, the breathing tubes (3) attached, the handle (4) raised to the upper, locked position (after insertion of the canister), the breathing bag (5) inflated and the OBA tested for proper operation.

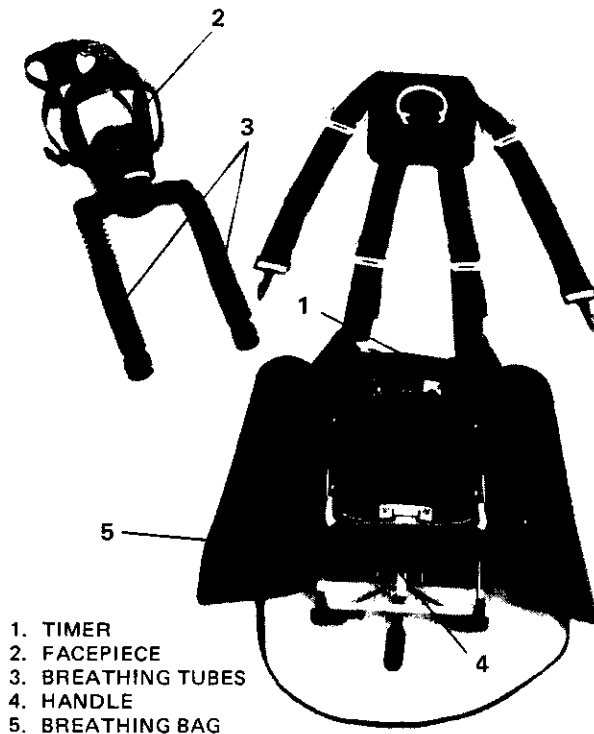


Figure 2-1. OBA

2-3. OPERATING PRECAUTIONS.

2-4. The following precautions must be observed during use of the OBA:

1. Use care to protect breathing bag and breathing tubes from damage. If breathing bag, breathing tube, or facepiece is torn or pierced while working in an unsafe atmosphere, cover damage with hand as well as possible and return to fresh air rapidly.

2. If canister is changed in fresh air without removing the facepiece, follow the canister starting and OBA checking procedures before leaving fresh air.

3. Never release the facepiece seal in an unsafe atmosphere, even if inhalation becomes difficult. Check the breathing tubes to see if kinked and restricting air flow. If a kinked tube is not the problem, return to fresh air immediately and have the OBA thoroughly checked.

4. This apparatus is rated for 60-minute maximum use, whether spent in a safe or contaminated atmosphere. The timer must never be reset from its original calculated safe value.

5. Never try to reuse a canister. Once the copper-foil seal is pierced, and the canister has been removed from the OBA, the canister must be considered expended.

6. In use, the canister gets hot; avoid touching it with bare hands.

7. Never allow any foreign substance to be used on the OBA or enter into the neck of the canister, especially *Oil, Gasoline, Water and Grease*.

8. The user of the OBA should be clean shaven as facial hair may prevent satisfactory facepiece sealing.

2-5. OPERATING INSTRUCTIONS.

2-6. The entire OBA will be donned, activated and operationally checked in an atmosphere that is not toxic, contaminated or oxygen deficient.

2-7. When properly donned, checked for operation, and the canister activated, the OBA will automatically absorb carbon dioxide and produce oxygen to maintain a life-sustaining atmosphere which the wearer breathes for a maximum period of 60 minutes.

2-8. The user should be so familiar with the detailed emergency donning procedures that they can be performed without reference to this manual. This manual may be referenced during normal donning procedures.

2-9. NORMAL OPERATION. The following procedures will be accomplished prior to entry into contaminated atmosphere.

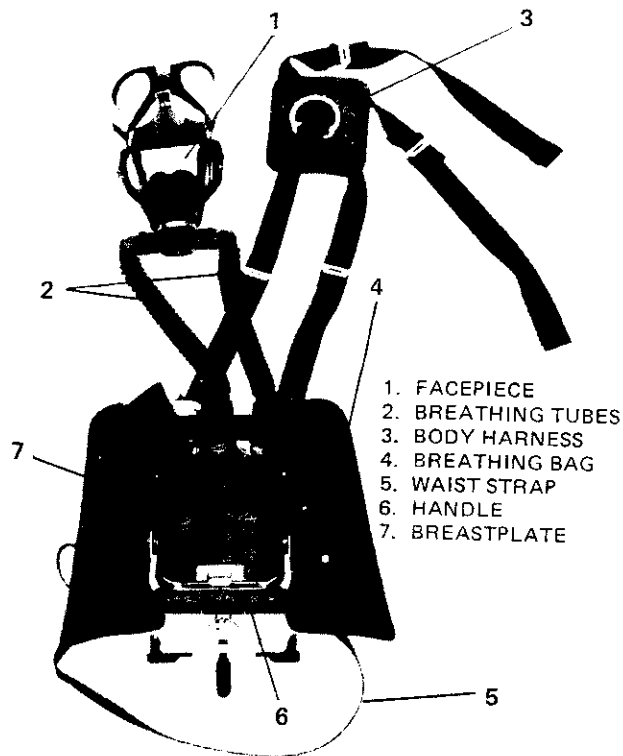


Figure 2-2. Check of OBA Before Use

2-10. PREPARE FOR DONNING. (See figure 2-2).

1. Check that handle (6) is down and locked in the load and standby position.

2. Attach facepiece breathing tube quick disconnects if unattached, to apparatus as follows:

a. Fully retract spring loaded outer sleeve of connector, exposing ball bearings (see figure 2-3).

b. Push connectors firmly over nipples (black onto black and blue onto blue (see figure 2-4).

NOTE

Quick disconnects are different sizes and color coded to assure proper assembly. It is possible to slide the larger connector on the smaller nipple but it will not latch nor seal. The OBA will not function if the connectors are not properly installed.

c. Release sleeve.

d. Test connection. Grasp hose at clamp and pull. Quick disconnects will not pull off if put on correctly.

3. Extend and straighten all straps on body harness (3) and waist strap (5). Make sure headharness straps are also fully extended and in position in front of the facepiece lens.



Figure 2-3. Retracting Outer Sleeve of Connector



Figure 2-4. Pushing Connector Over Nipple

2-11. DONNING PROCEDURE. Don the OBA in the following manner:

1. With one hand, grasp the facepiece at the combination valve housing and the apparatus at the operating handle (1, figure 2-5). With the other hand, grasp straps of body harness (2) and body pad D-ring and bring pad and harness over the head while positioning OBA on chest.

1. HOLDING FACEPIECE AND APPARATUS
2. HOLDING BODY HARNESS AND PAD D-RING



Figure 2-5. Lifting Straps Over Head

2. Locate the two straps hanging free in the back (see figure 2-6). Attach end of each strap to ring on each side of breastplate (see figure 2-7).



Figure 2-6. Locating Ends of Harness Straps



Figure 2-7. Attaching Harness Strap

3. Position the breastplate on the chest so that breathing tube connections are slightly below the shoulders and head movement is not restricted when the facepiece is donned. While holding the apparatus in this position, first adjust the two under-arm straps (see figure 2-8) and then adjust the two shoulder straps (see figure 2-9) until the apparatus is comfortably fitted. (The harness pad should be located in the center of the back down from the neck for a comfortable fit).



Figure 2-8. Adjusting Under-Arm Strap

4. Place the facepiece over the head in stand-by position until ready to activate the canister (see figure 2-10).



Figure 2-10. Placing Facepiece in Stand-By Position



Figure 2-9. Adjusting Shoulder Strap

5. Snap the waist strap to the bracket on lower side corner of the breastplate (see figure 2-11) and adjust to hold the apparatus snugly to the body (see figure 2-12). Secure the excess loop of waist strap by wrapping it under the secured part of the strap (see figure 2-13). Secure the ends of the lower body harness straps under the waist strap if they extend down to the waist after being adjusted.



Figure 2-11. Attaching Waist Strap



Figure 2-12. Adjusting Waist Strap



Figure 2-13. Securing Excess Loop of Waist Strap Under Secured Strap

6. Install canister, NSN 4240-00-174-1365, in the following manner:

a. Remove tear-off cap of canister by pulling tab backward and downward (see figure 2-14), exposing copper foil seal (see figure 2-15). Discard cap.



Figure 2-14. Removing Canister Cap



Figure 2-15. Exposed Copper Foil Seal

WARNING

When removing the candle cover, the lanyard must not be pulled so that the cotter pin is removed. Removal of the cotter pin fires the candle and starts generating oxygen. If this happens while the copper foil is intact, internal pressure in the canister will build up causing the copper foil or canister seam to rupture.

b. Remove the canister candle cover by rotating swivel plate 180°, and push it down toward center of the canister (see figure 2-16) leaving cover dangling by the lanyard.



Figure 2-16. Removing Candle Cover

c. Insert the canister (with neck up and concave, or ribbed side toward body) upward into the guard and breastplate assembly (see figure 2-17) until the canister is firmly retained by the bail (see figure 2-18). The canister is now locked in a standby position, with the copper foil seal still intact.



Figure 2-17. Inserting Canister into Breastplate

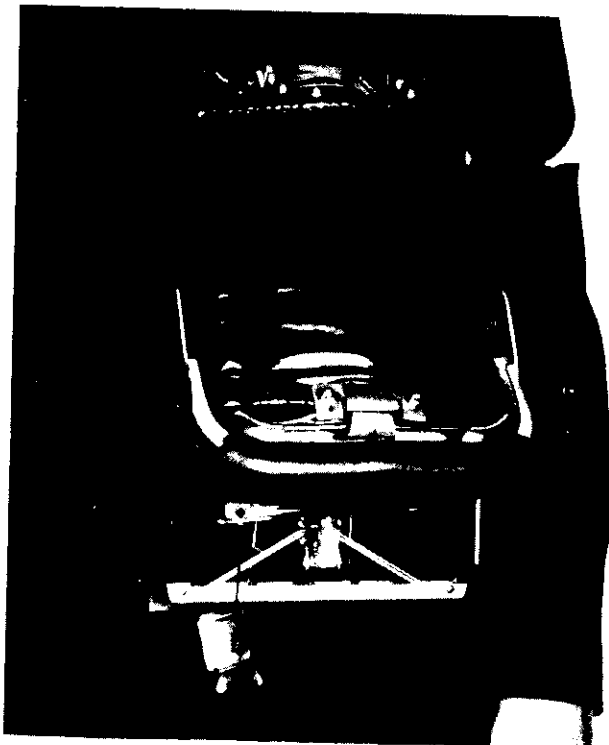


Figure 2-18. Retention of Canister in Standby Position by Bail

NOTE

If the copper foil seal is pierced when the canister is placed in the standby position, adjust the standby stop (refer to para 6-5). Do not use an OBA which pierces the foil seal in the standby position.

7. Don and adjust facepiece as follows:

a. Insert chin into chin stop of the facepiece (see figure 2-19).



Figure 2-19. Inserting Chin into Facepiece

- b. Pull headbands from the front of facepiece over your head (see figure 2-20).
- c. Make sure straps lie flat against head.
- d. Tighten lower or neck straps first (see figure 2-21).
- e. Tighten side straps (see figure 2-22). (Do not touch forehead or front strap).



Figure 2-20. Pulling Headbands over Head



Figure 2-21. Tightening Neck Straps



Figure 2-22. Tightening Side Straps

f. Place both hands on head harness pad (on back of head) and push it down toward neck.

g. Repeat operations d and e.

h. Tighten forehead or front strap if needed.

i. Make sure no hair is under facepiece seal.

8. Test the facepiece for sealing by squeezing the corrugated breathing tubes tightly (see figure 2-23). Inhale gently so the facepiece collapses slightly and hold breath for 10 seconds. The facepiece will remain collapsed while breath is held, provided the assembly is gas tight. If any leakage is detected around the face seal, readjust the head harness straps. If other than face seal leakage is detected, investigate the condition and correct it. The facepiece must be subjected to a sealing test before each use.



Figure 2-23. Testing Sealing of Facepiece

9. Make final adjustments on all four body harness straps so that the wearer can look up or down without having the facepiece shift or catch on the timer or main valve housing.

10. If going into a standby or ready condition, you may loosen the lower facepiece straps only (see figure 2-24) and remove the facepiece. The facepiece can then be placed over your head and out of the way until ready to start the canister and put the OBA into operation (see figure 2-10). In an emergency, this step will be eliminated.



Figure 2-24. Loosening Lower Facepiece Straps for Standby

2-12. STARTING CANISTER. When ready to enter the contaminated area, including determination of the timer setting (see para 2-14), start the canister in the following manner:

1. If facepiece is in stand-by position, put it on (figure 2-25) again before starting canister. Retighten lower straps and retest for facepiece sealing (refer to step 8, para 2-11).

NOTE

The handle will not swing upward and snap into the top lever locks if the metal canister cap has not been removed.



Figure 2-25. Donning Facepiece



Figure 2-26. Depressing Handle Tabs



Figure 2-27. Swinging Handle Up

2. Unlock the handle of the OBA using both hands to depress tabs from the bottom lock and swing handle upward until it snaps into the top lever locks (see figures 2-26 thru 2-28). Test handle to insure lock is secure by trying to push handle forward without depressing tabs.



Figure 2-28. Handle in Top Locked Operational Position

3. Pull lanyard on canister straight out away from body (see figure 2-29). This removes the cotter pin, fires the candle, and inflates the breathing bag with oxygen. A slight amount of harmless smoke may be present while the candle is burning.



Figure 2-29. Pulling Lanyard

4. While the candle is filling the breathing bag, depress the breathing bag at the pull tab with the left hand (see figure 2-30), and regrasp and seal off both breathing tubes with the right hand while pressing against the right side of the breathing bag with the right elbow (see figure 2-31). The bag must be compressed at the pull tab so that the relief valve does not vent during this test. This procedure tests the tube connectors, canister and breathing bag for tightness. The bag must remain inflated; otherwise, there is a possible leak in this OBA that must be checked or corrected before use.



Figure 2-30. Depressing Left Side of Breathing Bag



Figure 2-31. Depressing Right Side of Breathing Bag With Elbow

5. Breathe normally. The chemical reaction of the canister will generate more oxygen than is required. Overproduction of oxygen will be automatically vented by the relief valve in the bag when the bag reaches full capacity. A manual relief pull tab on the valve (see figure 2-32) is provided should the valve stick closed over a long storage period.



Figure 2-32. Relief Valve Pull Tab

CAUTION

DO NOT PULL the breathing bag tab during normal use because the oxygen in the bags will leak into the atmosphere causing loss of your breathing oxygen.

2-13. BACK-UP STARTING SHOULD CANDLE MISFIRE. If the candle does not fire, the breathing bag must be charged by inhaling fresh air and discharging it into the apparatus. This procedure MUST occur in safe air, as follows:

1. Work one finger under the edge of the facepiece, stretching the mask slightly to break the seal.
2. Inhale while grasping and squeezing both breathing tubes with the other hand to draw external air from outside the facepiece.
3. Release the breathing tubes, remove the finger and exhale into the facepiece.
4. Continue this cycle until breathing bag is fully inflated. Exhaust air in bags by pressure on the right-hand side until right bag is deflated. In this process, the moist breath passes through the canister to start the chemical reaction. One filling of the bag is not usually sufficient to fully activate the canister.

5. Reinflate and deflate the breathing bag as directed in steps 1 through 4 at least five times. Now, without gloves, cautiously feel the bottom of the canister. If it is warm, oxygen is being generated and apparatus is ready for setting the timer and operational check. If canister is not warm, repeat steps 1 through 4. (In lower temperatures, several cycles of inflating and deflating the bag may be required to start oxygen production..)

2-14. SETTING TIMER. Set the timer by turning pointer clockwise to 60 and then return to 45 or whatever other setting is being used. This is necessary to fully wind the alarm bell.

2-15. The breathing apparatus supplies ample oxygen for 60 minutes use even with considerable exertion, but additional time cannot be safely allowed for less strenuous effort; 60 minutes of operation, as specified on the canister, must be considered as maximum. Time allowance should be made for returning to clear air based on leaving the contaminated area when the bell rings at zero. The following example illustrates the procedure to determine the timer setting (non-applicable portions may be omitted, thus increasing the time allowed for work).

2-16. Always allow 5 minutes for timer error. Assuming that 7 minutes will be required to reach the work area (from the safe-air starting point), an equal time, 7 minutes, must be allowed for returning to the safe area. These allowances are summarized as follows:

Allowance	Time, Minutes
Maximum timer error	5 (ALWAYS)
Time to reach work area	7
Time to return from work area	7
Total allowance for safety	19
Time allowed for work	41

2-17. Turn the timer knob (see figure 2-33) to the calculated safe time (to 60, then back), then carry out the work assignment. When the timer bell rings at zero, user must begin return to fresh air immediately, even if work is not finished.



Figure 2-33. Setting Timer

2-18. In the example given for determining the timer setting, there will be approximately 41 minutes available for work in the contaminated area. For safety, all the allowances are taken at the end-portion of the 60-minute period to permit the user to reach safe atmosphere before the oxygen supply is used up.

2-19. When all foregoing checks are satisfactory, the wearer may enter the contaminated atmosphere.

2-20. REMOVING CANISTER.

WARNING

In the event expended canisters cannot be disposed of after use and must be temporarily stored until disposal action can be taken, extreme caution must be exercised when handling and storing expended canisters. Never allow *grease, oil, or water* to enter neck of canister as any of these liquids can cause violent chemical reaction and may even cause canister to rupture. Preventive measures shall be taken to eliminate possible entry of these substances into expended canister during temporary storage.

1. If the canister copper foil seal has not been punctured (candle has not fired), the canister is readily removed by placing one hand on the bottom of the canister, and pulling the canister releasing strap (see figure 2-34).



Figure 2-34. Pulling Canister (Cold) Releasing Strap

NOTE

Gloves are not required in this case. Handle must be in load and stand by position.

2. Protect the intact copper-foil seal on this canister with one of the spare aluminum caps that have been provided for this purpose.

3. If the canister has been used remove facepiece (refer to step 1, para 2-21) and put it over your head in the standby position (see figure 2-35). Then unlock the handle from the Operational Position (see figure 2-28) and swing down to the load and standby position.



Figure 2-35. Facepiece in Standby Position

NOTE

Facepiece may be left on if another canister is going to be inserted immediately into the apparatus. Leak test (step 8, para 2-11) should be performed before going back to work.

4. To remove canister, spread legs apart and lean upper part of body slightly forward. Release the used canister by pulling the canister release strap (see figure 2-36). The canister will drop out of the apparatus. Protect the hands with gloves (cotton inside asbestos) or other suitable means, as this used canister may be hot (see figure 2-37).



Figure 2-36. Pulling Canister (Hot) Releasing Strap

5. Do not attempt reuse of this canister. Discard as directed in para 2-22.

2-21. APPARATUS REMOVAL. Remove in the following manner:

1. Remove facepiece by releasing headstraps at the buckles with fingertips (figure 2-38) before pulling headpiece off.

NOTE

If the canister is still in the apparatus place the facepiece over your head in the standby position and remove the canister. If the canister is out, let the facepiece hang down in front of the apparatus.

2. If facepiece is in standby position, remove and let it hang in front of the apparatus.



Figure 2-37. Removing Hot Canister



Figure 2-38. Releasing Headstraps

3. Loosen waist strap (see figure 2-39) then unhook it.



Figure 2-39. Loosening Waist Strap

4. Loosen shoulder straps (see figure 2-40) and unhook harness at upper corners of breastplate assembly. Grasp facepiece and operating handle with one hand, (figure 2-41) and either shoulder harness, preferably at D-ring connector, with other hand, and lift apparatus over your head (figure 2-42).



Figure 2-41. Grasping OBA for Removal



Figure 2-40. Loosening Shoulder Strap



Figure 2-42. Removing OBA

5. If wet or moist, wipe down apparatus.
6. Always clean apparatus after each use. Refer to para 4-3 for cleaning instructions.

2-22. CANISTER DISPOSAL.

2-23. Wear heat protective gloves (cotton inside of asbestos, or equivalent) and safety glasses or faceshield when processing canister before discarding. Prevent foreign particles from entering neck of canister. Provide a clean, metal container filled with at least 4 gallons of clean water to a level that will cover the canister by at least 3 inches over the highest part. Perform disposal operations in a well ventilated area. Proceed as follows:

CAUTION

Do not puncture canister if underground or below deck. Remove expended canisters to surface prior to puncturing.

1. With clean metal piercing tool (no oil or grease), punch at least two holes, 1/2 inch diameter minimum, in the bottom only.

WARNING

The canister chemicals and the water in which canister is immersed are injurious to skin and equipment. Avoid contact and dispose of the strongly alkaline water where it will not harm personnel or equipment. Avoid direct breathing of fumes.

2. With gloves on turn the face to one side and slowly lower the pierced canister into the water filled container (figure 2-43). Canister must be completely covered with at least 3 inches of water.



Figure 2-43. Preparing Canister for Discard

3. Avoid the spattering liquid (figure 2-44). The reaction will continue until bubbling stops; cessation of bubbling indicates that chemical is expended.

4. Using tongs, carefully remove canister from solution, drain excess from canister (shake if necessary) and discard.

5. Use care that solution does not contact skin, or splash on clothing. Dilute each 4 gallons of water used per canister with 8 gallons of clear water and pour directly into a suitable drain.

6. Thoroughly rinse metal container to remove all traces of solution.

2-24. STORAGE.

2-25. Apparatus and canisters must be stored in a cool dry place. Life of the breathing apparatus will be lengthened if stored under these conditions. The term "cool" denotes temperatures from above freezing up to 110°F (43°C) when stored out of direct sunlight. The term dry is usually used to denote an area where condensation does not come in contact with the item.



Figure 2-44. Expending Canister Chemicals

CHAPTER 3

FUNCTIONAL DESCRIPTION

3-1. DESCRIPTION.

3-2. A facepiece (1, figure 3-1) is mounted on the face and head of the user and is adjusted to seal against external atmosphere. An inhalation tube (3) and exhalation tube (7) connect the facepiece to the breastplate group (4 thru 6) which is carried by a shoulder harness and a waist strap. The breastplate group includes a canister guard into which a chemical canister (6) is inserted to prepare for use.

3-3. As the user exhales, moist breath is carried by the exhalation tube (7) through the valve housing to the bottom of the canister (6) from whence it passes upward through the chemical. In so doing, carbon dioxide is absorbed and the moisture present reacts with the chemical to give off oxygen. This oxygen passes into a breathing bag (4) (part of the breastplate group) from which the inhalation tube (3), allows the breathable mixture to be drawn into the facepiece under normal respiration.

3-4. Check valves (2 and 8) are used in the inhalation and exhalation passages and an automatically operated pressure relief valve (5) in the breathing bag relieves excess pressure in the breathing bag. A speaking diaphragm unit is built into the facepiece to allow conversation while the apparatus is in use. A timer is attached to the breastplate group to warn the user when his oxygen supply is running low.

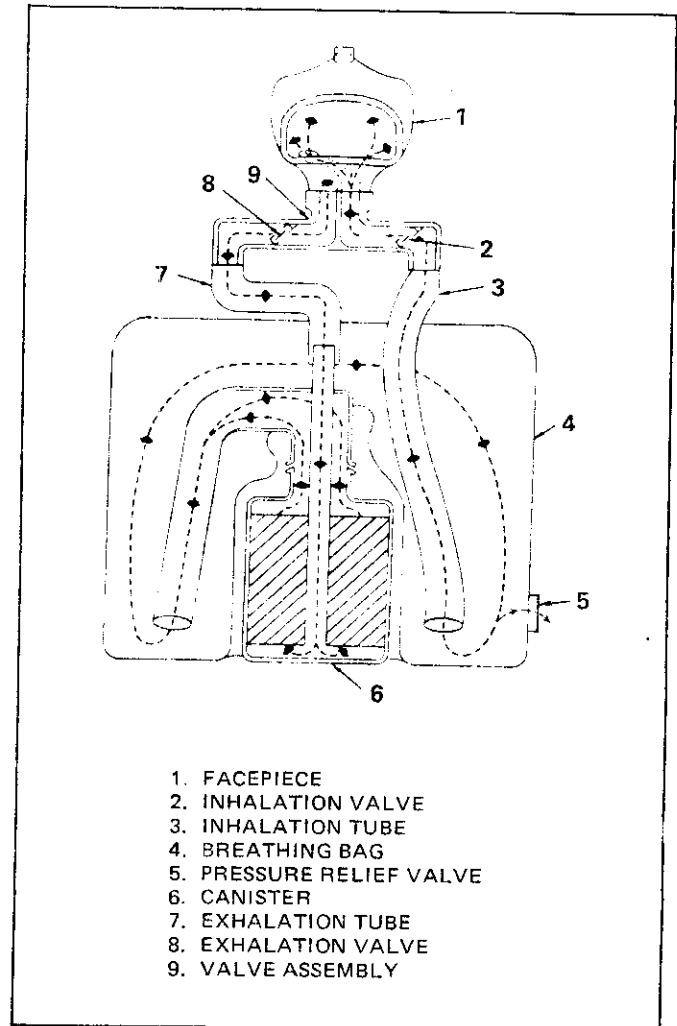


Figure 3-1. Air Flow Schematic

CHAPTER 4

SCHEDULED MAINTENANCE

4-1. INTRODUCTION.

4-2. This chapter provides instructions for cleaning and inspecting the OBA.

4-3. CLEANING.

4-4. FACEPIECE. Clean the facepiece assembly after each use with suitable disinfectant solution.

1. Using soft brush, clean cloth or sponge, thoroughly wash facepiece and breathing tubes.

2. Thoroughly rinse in clean, warm water and allow to air dry. To reduce drying time, wipe off excess water then air dry.

WARNING

Never use *alcohol, oil, gasoline, grease* or any hydrocarbon compound to clean the OBA. This apparatus generates oxygen which supports combustion.

4-5. OBA LESS FACEPIECE. Clean the body only externally as required. Use mild soap and water, wipe off with a damp cloth and rinse as needed with a wet cloth. Wipe off excess moisture with a clean towel and air dry.

4-6. TESTING.

4-7. Whenever the OBA is disassembled (even partially), it must be leak tested after reassembly.

4-8. Don and test the facepiece as directed in paragraph 2-11, steps 7 and 8.

4-9. After any disassembly and reassembly of the oxygen circuit of the OBA, test as directed in paragraph 2-12, step 4. Check any possible leakage point with soap solution. If a bubble forms, and breaks, there is leakage. Make repair or replacement before using OBA in contaminated area.

4-10. ANTIFOGGING LENS.

4-11. To reduce the possibility of the lens fogging, Fogpruf-P, PN39474 FSCM 55799, should be applied just before use (if time permits), just before storage, and re-applied during each scheduled maintenance. Proceed as follows:

WARNING

Fogpruf-P contains 40% ethylene glycol. Do not permit contact with any mucous tissue (eyes, mouth or nose). Do not swallow. If there is accidental contact with mucous tissue, flush immediately with clean water. If swallowed, induce vomiting immediately and consult a physician.

1. Using a lint-free lens tissue or lens cloth, apply enough anti-fogging compound to completely cover the inside surface of lens. This application cleans the lens.

2. Rub dry with lens tissue (cloth).

3. Apply a second layer to inside of lens to completely cover entire surface with liquid. Do not remove.

4. Antifogging compound may be applied to outer surface of lens for cleaning purposes, however, always rinse lens with clean water and rub surface dry to eliminate lens spotting.

4-12. PERIODIC INSPECTION.

4-13. Since this apparatus is operationally checked before each use, periodic inspection must be aimed at locating effects of age or weaknesses before operating problems develop. Human safety is at stake, and if there is any doubt as to serviceability of a particular item, repair or replace as required. The complete inspection given is to be accomplished each 3 months. This period may not be extended but may be shortened when such periodic inspections do result in finding repair or replacement necessary.

4-14. INSPECTION PROCEDURE.

4-15. Perform the inspections in table 4-1 periodically as indicated in paragraph 4-13.

4-16. LUBRICATION.

WARNING

No lubrication is required or permitted. This apparatus generates oxygen which will support combustion if it comes in contact with *grease, oil, gasoline*, or other combustible matter.

4-17. No lubrication is required or permitted.

Table 4-1. Inspection

POINT OF INSPECTION	METHOD	CHECK FOR	CORRECTIVE ACTION
Facepiece	Visual	Holes, tears, or breaks in lens; stretched or torn straps, damaged buckles, loose clamp, or aged rubber.	Tighten clamps or replace straps or facepiece.
Lens	Visual	Scratches, cracks, loose lens ring clips or loose two-piece lens ring.	Tighten or replace with two-piece lens ring; replace lens.
Diaphragm assembly	Test	Hole or weakness by placing mouth over external ring and blowing with some pressure.	Replace if pressure does not hold.
	Visual	Holes, tears, breaks, burned, or otherwise deteriorated material.	Replace.
Breathing tubes	Test	Holes or weakness by squeezing at hose clamp and blowing at coupling with some pressure.	Replace if pressure does not hold.
Tube couplings	Test	Loose connections.	Tighten.
Breathing valves, valve assembly	Visual	Corrosion or damage. Release hose clamps and work tube off — valve can then be drawn out for examination.	Replace.
Pressure relief valve	Visual	Corrosion or damage.	Replace.
Plunger assembly	Test	Sticking or binding by depressing several times.	Replace.
Timer	Test	Check timer by setting at 60-minute mark and comparing rundown time with accurate clock. Timer must be accurate within ± 5 minutes.	Replace.
Shoulder harness, waist strap	Visual	Frayed or torn material; crack in snap ring or buckle.	Replace.
Bail	Visual	Corrosion, cracks or loose mounting nuts.	Tighten loose nuts or replace canister retaining system.
Breathing bag	Visual	Worn or frayed material; check mounting tabs for serviceability.	Replace.
Breastplate	Visual	Torn insulation, deformation or cracks.	Replace.

CHAPTER 5

TROUBLESHOOTING

5-1. TROUBLESHOOTING.

5-2. The operational checks made during donning (paragraph 2-11), step 8, paragraph 2-12, step 4) should indicate leakage problems before user enters a contaminated atmosphere. If such problems are encountered in an unbreathable atmosphere, return to fresh air at once before attempting to localize trouble by the procedure given in figures 5-1 thru 5-4.

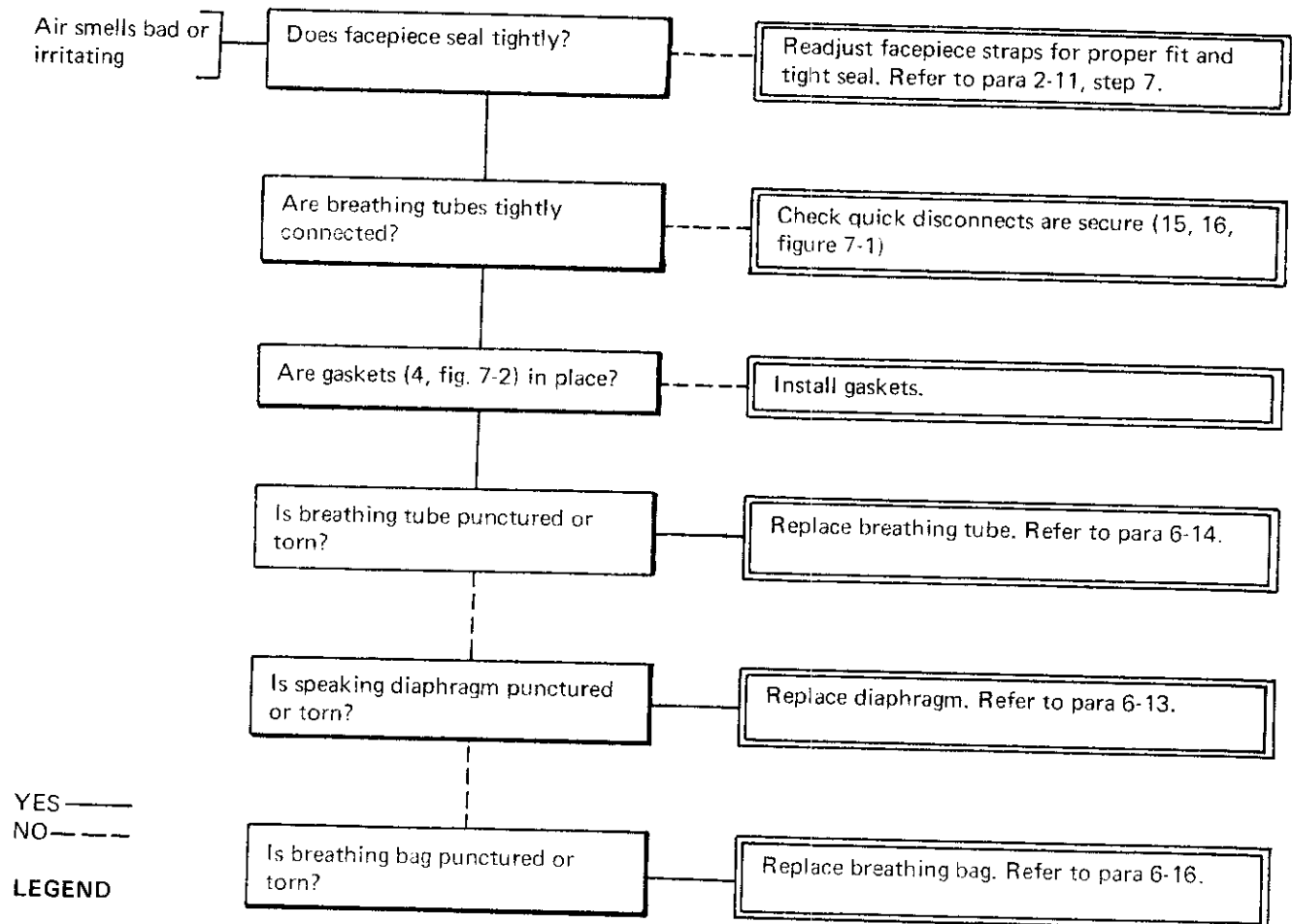


Figure 5-1. Locating Leakage

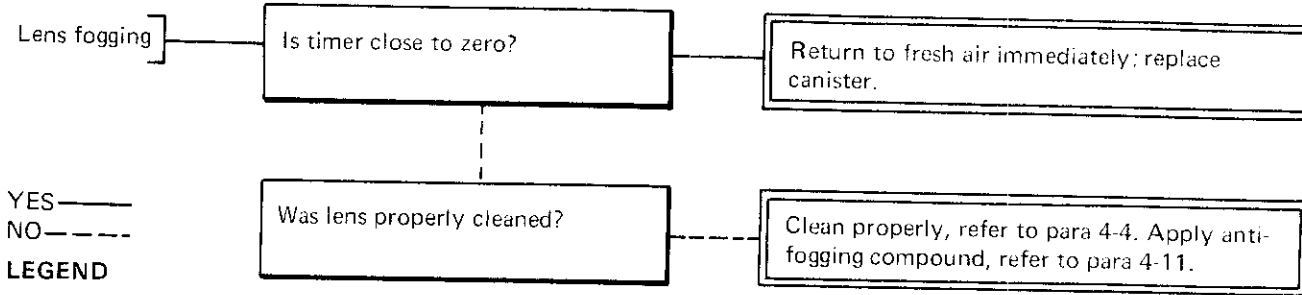


Figure 5-2. Canister Near Depletion

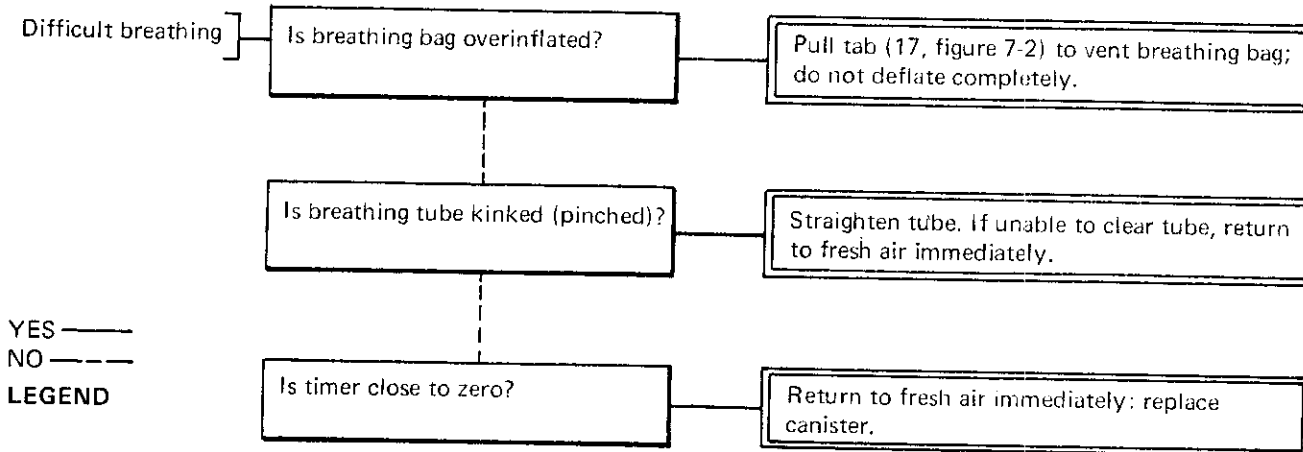


Figure 5-3. Not Enough Air

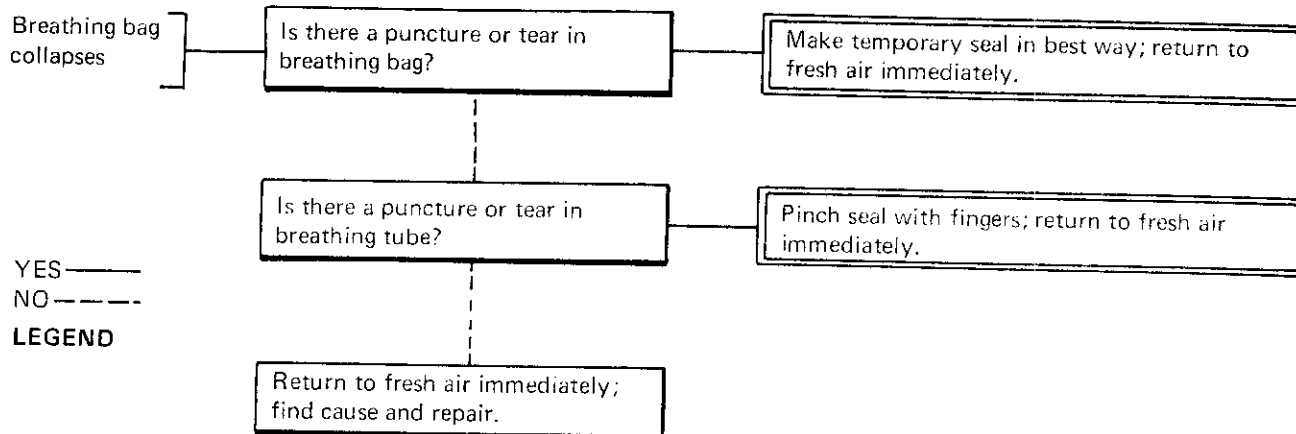


Figure 5-4. Sudden Air Loss

CHAPTER 6

CORRECTIVE MAINTENANCE

6-1. INTRODUCTION.

6-2. This chapter provides instructions for possible adjustments and for permissible repair and replacement of parts and assemblies.

SECTION I ADJUSTMENTS AND ALIGNMENT

6-3. ADJUSTMENTS.

6-4. TOP CATCHES. Adjust the right and left catches (23 and 30, figure 7-2) in the following manner:

1. Insert a used and deactivated canister, NSN 4240-00-174-1365, into the breastplate (refer to para 2-11, step 6) and raise handle to the operating position.

NOTE

Make sure that lockwashers and parts are installed as shown in figure 7-2 while adjusting catches.

2. Loosen two screws (21, figure 7-2) and position right catch (large) (23) so that it mates with the latch bar, attached to the bail, for positive retention.
3. Retract the bar to unlatch using the thumb depressors. While retracted, measure the clearance between the bar and catch to be from $1/32$ to $3/32$ inch.
4. If necessary, reposition catch to have proper clearance when the latch bar is retracted, and to mate with the bar in the latched position.
5. When right catch is properly adjusted, tighten the two screws (21) with torque of 45 to 55 pound-inches. Recheck latch operation and catch clearance after tightening. Repeat steps 2 thru 5 as necessary to obtain correct operation.
6. Lower the handle, remove the canister and raise handle to operating position.
7. Loosen two screws (28) and position left catch (small) (30) to mate with the latch bar.
8. Tighten two screws (28) with torque of 45 to 55 pound-inches.

6-5. STANDBY STOP. Adjust the standby stop (part of retaining system (28, figure 7-3) in the following manner (see figure 6-1):

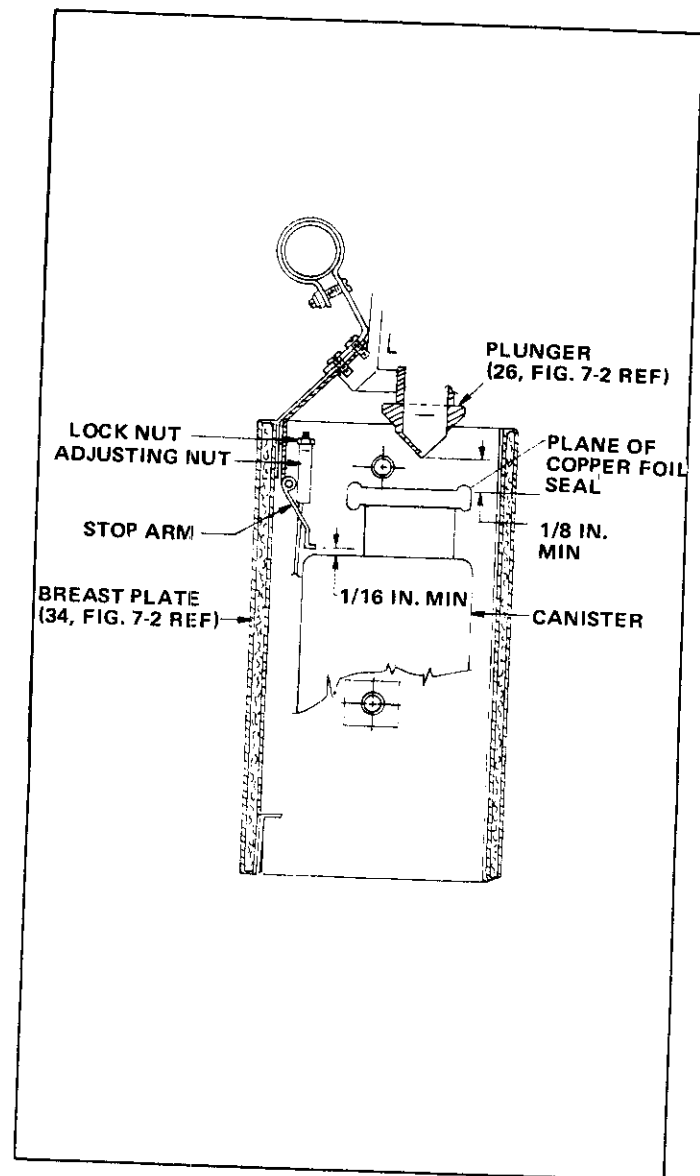


Figure 6-1. Clearances for Standby Stop

1. Insert a used and deactivated canister, NSN 4240-00-174-1365, into the breastplate (refer to para 2-11, step 6) to the standby position. Keep handle in the down, latched position.

2. Loosen the lock nuts (figure 6-1) and position the adjusting nuts so that the stop arm clears the canister top by 1/16 inch minimum.

NOTE

Reaching the nuts for adjustment may be easier with the canister removed and the handle placed in the operating position. If done this way, several trials may be required to obtain the correct adjustment.

3. Invert the breastplate (timer down) and measure the clearance between the point of plunger (26, figure 7-2) and the plane for the copperfoil seal to be 1/8 inch minimum (see figure 6-1).

4. After adjustment is correct, tighten the lock nuts with torque of 13 to 17 pound-inches.

5. Recheck clearances after tightening lock nuts. Repeat steps 1 thru 3 as necessary to obtain correct clearances.

6-6. **BOTTOM CATCH.** Adjust bottom catch (10, figure 6-2) in the following manner:

1. Remove cap nuts (5) and shield (6).

2. Loosen two hex. nuts (7).

3. Slide bottom catch (10) up or down so that wire spring in latch bar (part of retaining system [28, figure 7-3]) engages the slot in bottom catch positively, when handle is down.

4. Tighten two nuts (7, figure 6-2) after adjustment.

5. Replace shield (6) and tighten cap nuts (5).

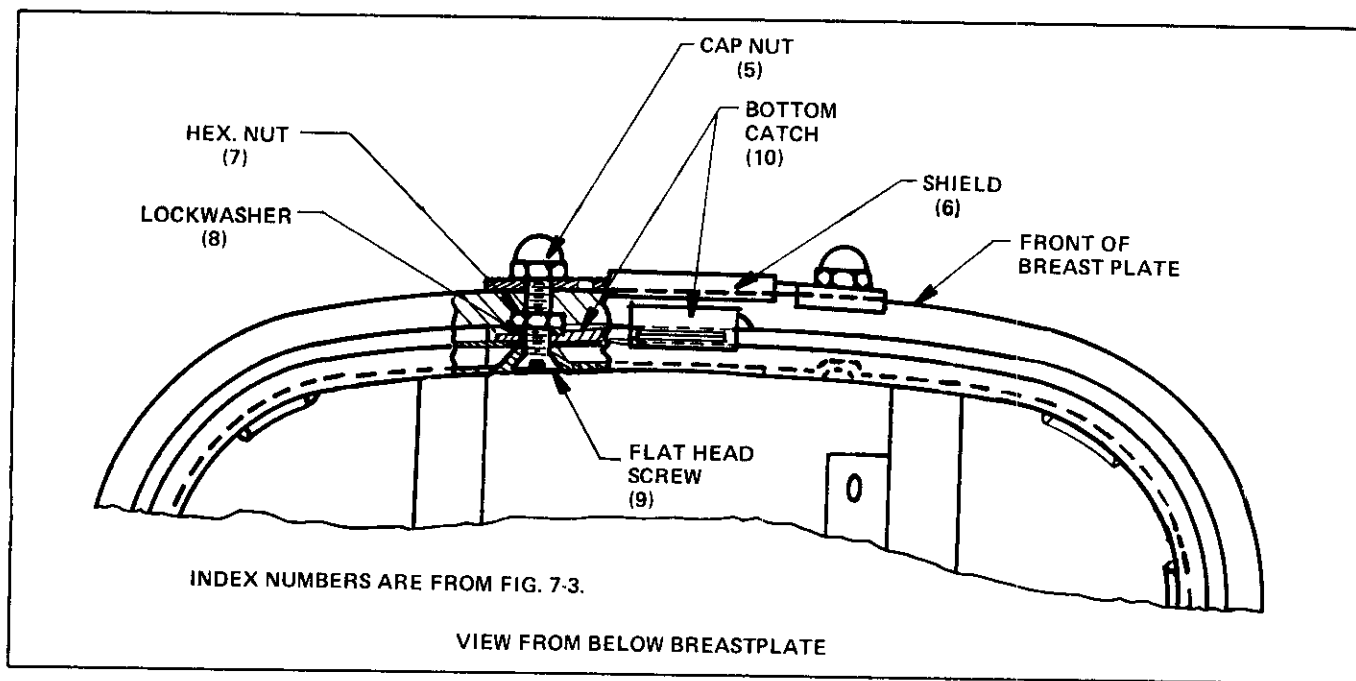


Figure 6-2. Bottom Catch Adjustment

SECTION II REPAIR

6-7. REPAIR.

WARNING

Be very careful that no grease or petroleum products contact the flow passages. The breathing apparatus generates oxygen, which in contact with such fluids, is apt to cause fire.

6-8. Perform work in a clean area with a clean space to set aside parts removed. Disassemble only to the extent neces-

sary for replacement of parts. Only the procedures given in this section are authorized; if no directions are given for a procedure, such a procedure is not to be attempted.

6-9. Figures 7-1 thru 7-3 are indexed in an order of disassembly. Disassemble in the order of the index numbers on the applicable exploded view, as necessary to remove the damaged or defective part. Assemble in the reverse of disassembly. Apply one layer of 1/2-inch tape, P/N 22350 (FSCM 55799), over rubber ends to be under hose clamps for all connections of breathing hoses and breathing bag.

6-10. In general damaged or defective parts or components are to be replaced instead of repaired. Brackets or supports may be straightened if deformed, except that if holes are elongated, the part should be replaced.

6-11. ULTRAVUE FACEPIECE, LENS AND LENS RING. (See figure 7-1.) The OBA facepiece has been furnished with two types of lens rings. The one using clips and one-piece lens ring is obsolete and has been replaced by a two-piece lens ring, the pieces being clamped with screws and nuts. Replace parts of the facepiece, when damaged, in the following manner:

NOTE

The lens is covered with protective papers. Do not remove these papers until lens is completely installed in the rubber facepiece. If papers are removed before installation, the lens may be scratched or otherwise damaged.

1. Obsolete One-Piece Lens Ring. Before removal of damaged lens, note that the flange of the rubber facepiece is under the retaining flange of the lens ring (see figure 6-3). Also note that the rounded hook of the clip engages the indexing groove at the back of the rubber flange (see figure 6-4).

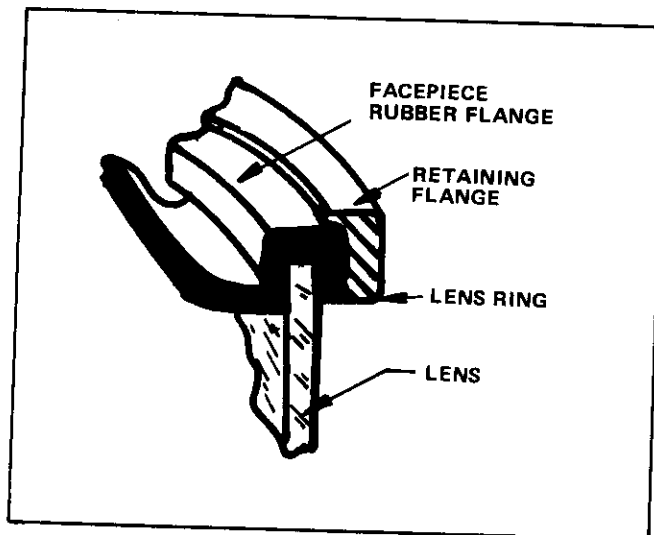


Figure 6-3. Partial Section thru Facepiece at Lens

- a. Remove eight lens ring clips (4, figure 7-1). Insert a hook type bottle cap remover into the slot between the clip and lens ring and pry up away from lens (see figure 6-5).
- b. Remove lens ring (5, figure 7-1) and lens (9).
- c. Remove all dirt and lens fragments from lens groove of facepiece.

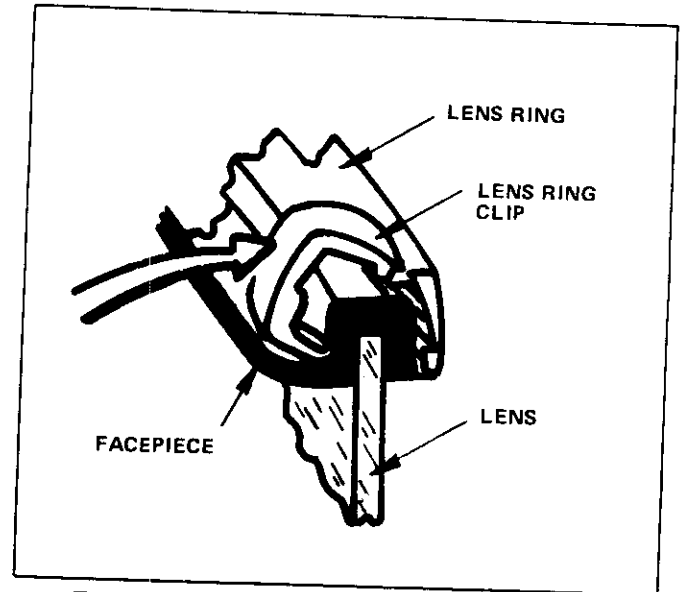


Figure 6-4. Lens Ring and Clip Assembly Detail

NOTE

One-piece lens ring and lens ring clips are not available for service. Only the two-piece ring should be used when facepiece parts must be replaced.

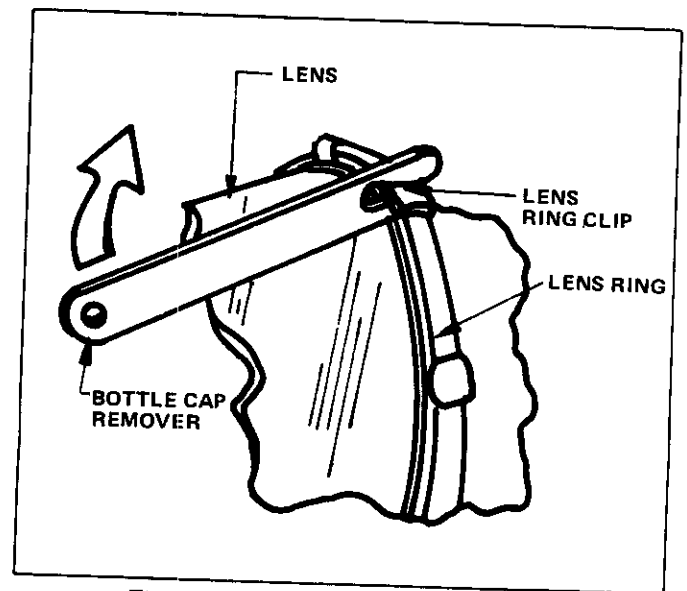


Figure 6-5. Removing Lens Ring Clips

2. Two-Piece Lens Ring. Remove two each nuts (6) and screws (7) and peel off two lens rings (8). Remove all dirt and lens fragments from lens groove of facepiece. Assemble two-piece lens ring type as follows:

- a. Align the index marks at top and bottom of new lens with the vertical center line of the facepiece and insert lens into facepiece groove. After insertion, press the flange against the edge of lens all around to ensure proper sealing.

b. Place facepiece on lap with lens up. Align lens ring (8) arrow (center) with mask centerline and press into place.

c. Assemble second lens ring (8) in same manner so that gaps between lens rings are at sides (where the cheeks are when facepiece is donned).

d. Press nuts (6) into grooves of lens rings (grooves are shaped to retain nuts.)

CAUTION

Use care not to tighten screws (7) too much. Rubber must not extrude between lens ring ends at the joint.

e. Install screws (7) in tapered hole and tighten just enough to bring ends of lens ring together. If rubber extrusion occurs, loosen screws, repeat steps b and c to check for correct alignment and retighten screws.

f. Make certain that the facepiece flange is under the retaining flange of the lens ring, all the way around.

3. Don the facepiece and adjust to the face (refer to para 2-11, step 7). Crimp off breathing tubes and gently expand lungs (inhale a little) and hold (refer to para 2-11, step 8). The facepiece should collapse toward the face and remain while slight vacuum is maintained.

4. If the facepiece collapses and slowly expands, there is leakage around the lens. Recheck the adjustment of facepiece to the face. If that appears correct, and leakage persists, the lens must be removed, the facepiece groove examined for particles, the lens reinstalled and the facepiece tested for leakage.

5. After satisfactory testing (no leakage) remove all protective papers and apply antifogging compound to inside surface of lens (refer to para 4-11).

6-12. HEAD HARNESS, BUCKLES. Replace head harness (1, figure 7-1) by threading each strap through the buckle assemblies (2 and 3) as shown in figure 6-6. Install so that the date stamp on harness is away from wearer's head. Use a small screwdriver to stretch the facepiece holes for removing or installing hooks of buckles. Apply one or two drops of Fogpruf-P, P/N 39474 (FSCM 55799) to each hole to make the hooks slide easier.

6-13. COMBINATION VALVE. The speaking diaphragm (23, figure 7-1) can deteriorate when exposed to direct flames. The exhalation (20) and inhalation (21) valves will need cleaning and may need replacement (repair is not authorized). Note the following during such maintenance:

1. The valves will easily slide out of the body (25). Do not remove the rubber flapper. Do not scratch the plastic seat for the flapper.

2. Use the wrench (28) to remove valve cap (22) for replacing diaphragm (23) and gasket (24).

3. Clean parts in the same manner as for the facepiece (refer to para 4-4).

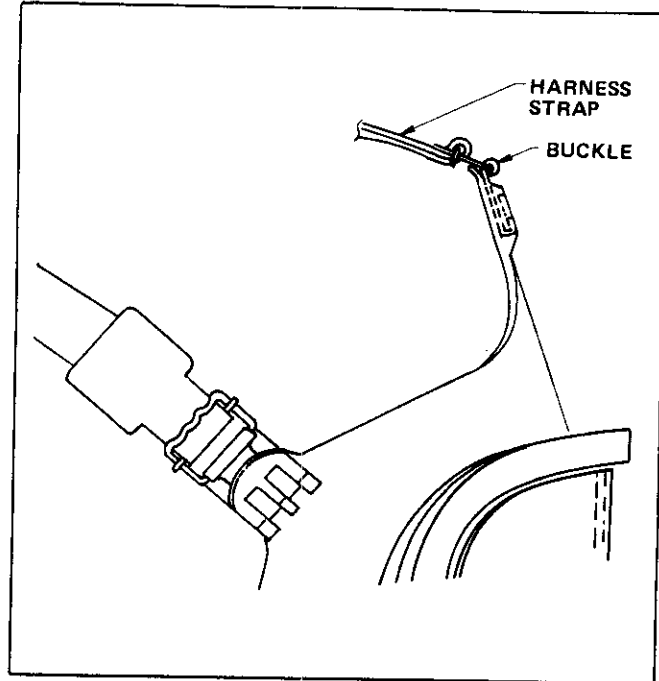


Figure 6-6. Attachment of Harness Straps and Buckles

CAUTION

Inhalation and exhalation valves must be installed in the correct sides of the valve body. Improper installation of these valves will result in malfunction of OBA.

4. When installing inhalation and exhalation valves, align the ridges of each valve with the corresponding slots in the body.

5. Tighten valve cap (22) with wrench (28).

CAUTION

If the combination valve is installed upside down, the OBA will malfunction.

6. Install the combination valve (20 thru 25) in the facepiece with the United States Patent number at the bottom. Make sure the body extends completely into the facepiece and that the body lugs engage the recesses in the facepiece.

7. After assembly of breathing tubes to facepiece, test as follows: Don and adjust facepiece (refer to para. 2-11, step 7). Test facepiece for leaks (refer to para 2-11, step 8). Test facepiece to insure check valves are properly installed. Squeeze left hand breathing tube only (inhalation tube) and inhale. Mask should collapse against face. This indicates the exhalation check valve is functioning. Squeeze right hand breathing tube only (exhalation tube) and exhale. Mask should move away from face. This indicates the inhalation check valve is functioning. If the reverse occurs, the check valves have been installed improperly and must be corrected and retested before the apparatus is used.

6-14. BREATHING HOSE, COUPLING ASSEMBLIES. When replacing a breathing tube (17, figure 7-1) or couplings (18 and 19), note the following:

1. Use a small amount of Fogpruf-P, P/N 39474 (FSCM 55799), to ease installation of breathing tube on the female halves of couplings. Stretch rubber end over the head of nipple. Apply one layer of 1/2-inch tape, P/N 22350 (FSCM 55799), around end of tube to be under hose clamp.

2. To remove the male section of the couplings (attached to plunger and elbow of OBA), loosen set screws at the sides then rotate counterclockwise.

WARNING

Inhalation and exhalation couplings are different from each other. They must be installed correctly. If incorrectly installed the OBA will malfunction and the user may suffocate.

3. Install the exhalation coupling (18) male section (black) on the plunger assembly (26, figure 7-2), and the inhalation coupling (19, figure 7-1) male section (blue) on the inhalation elbow (33, figure 7-2). Tighten both with a torque of 10 to 12 pound-inches and retighten set screws at the sides.

4. After assembly of breathing tubes to facepiece, test as directed in paragraph 6-13, step 7.

6-15. NOSECUP ASSEMBLY. The nosecup is elastically stretched over the combination valve body (25, figure 7-1). Remove by holding valve body and pull nosecup off. To install, orient properly and stretch over the valve body.

6-16. BREATHING BAG. To replace breathing bag (20, figure 7-2) remove two nuts (13), loosen 4 clamps (7), and slide bag connectors off tube (12), plunger (26) and inhalation elbow (33). Install in reverse order and test for leakage after assembly is complete.

1. Install dummy canister in apparatus.
2. Rest apparatus on suitable bench.

CAUTION

Do not inhale air from apparatus. Air in apparatus may contain insufficient oxygen since a dummy canister is being used.

3. Don facepiece (para 2-11, step 7) and inflate breathing bag as described in para 2-13, steps 1 thru 3. With breathing bag fully inflated, grasp both breathing tubes lightly and squeeze them together so that no leakage can occur through tubes.

4. Remove Facepiece.

5. Depress the breathing bag at the pull tab with one hand. While still holding breathing tubes closed, exert a light pressure on right side of bag with right forearm or elbow. The bag must be compressed at the pull tab so that the relief valve does not vent during this test. This procedure tests the tube connectors, canister, breathing bag

and valve for leakage. If the bag deflates, all connections must be checked for leakage. A soap solution can be used and observed for bubbling to locate leaks. Correct all leakage points before apparatus is used. Keep system inflated to prevent soap solution from entering system.

6. Remove the soap solution from joints by washing with clean water, then let air dry.

6-17. RELIEF VALVE. Remove and replace relief valve (19, figure 7-2) from breathing bag in the following manner:

1. If breathing bag is attached to breastplate, remove one self locking nut (13) from the same side as the relief valve.

2. Pull the valve cover (18) from the valve body.

3. Remove the tape and wire clamp holding the grommet against the valve body (see figure 6-7).

4. Pull the relief valve (19) partially from the back of the breathing bag.

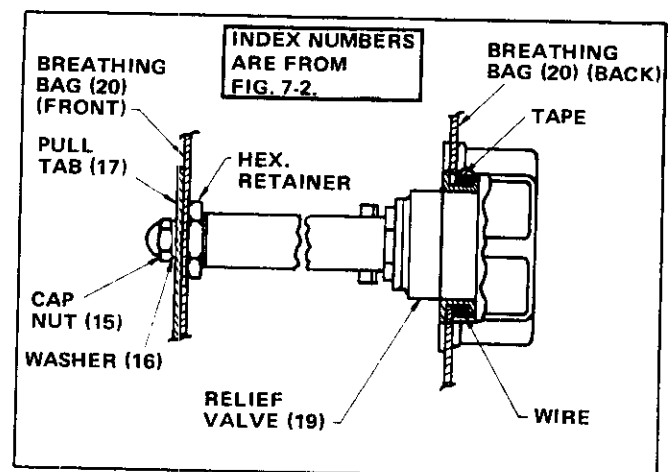


Figure 6-7. Relief Valve Installation

5. Hold the hexagon retainer inside the bag at the front and remove the cap nut (15) and washer (16). Withdraw the valve from the bag.

CAUTION

While cleaning and testing relief valve use care not to scratch the valve seat. If seat is scratched, oxygen will be lost from the breathing bag during use.

6. Flush valve with clear water to clean. Be sure all minute particles are removed from seat.

7. Inspect valve to insure that valve opens and closes freely. If valve opens or closes sluggishly or parts are broken, replace complete valve assembly. Inspect rubber components for small cracks, signs of wear or mis-shaped parts. If any of these conditions exists, replace complete valve assembly (19).

8. After installing relief valve, used or replacement, test the apparatus for leakage (refer to para 6-16, steps 1 thru 6).

6-18. **TIMER.** If the timer (6, figure 7-2) should malfunction, check to determine if the frame has been distorted. If straightening the frame does not correct the problem, replace the timer. Remove the four screws (5) and install a new timer. Make sure timer dial reads with the 60 minute digit away from the wearer of the apparatus.

6-19. **PLUNGER.** If the plunger (26, figure 7-2) point does not move freely in and out, or the body is cracked, remove two screws (8, 21 and 25) at each location, discard defective plunger and install a new plunger assembly. Test for leakage (refer to para 6-16, steps 1 thru 6) after installation.

6-20. **CANISTER RETAINING SYSTEM.** If the retaining system (28, figure 7-3) is damaged so that operation is difficult or impossible, remove two each nuts (14 and 15), four lock washers (16), two each screws (17 and 18), four nuts (20), one nut (22), one screw (23), two screws (8, figure 7-2), locknut and adjusting nut (figure 6-1). Force (spring) the rails loose from the studs of the breastplate assembly (24, figure 7-3). Do not lose the four spacers (21) as the retaining system is removed. Reverse the procedure to install a new system. If the tab (27) is replaced, make sure new tab moves freely through the slot in the bail after assembly. Adjust stop as directed in para 6-5.

6-21. **BREASTPLATE.** If the guard and breastplate assembly (guard and insulation assembly [24, figure 7-3]) is deformed, or the insulation cover is cut, remove all parts and components (see figures 7-2 and 7-3) and install a new breastplate. Test system as described in 6-16, steps 1 thru 6.

CHAPTER 7

PARTS LIST

7-1. INTRODUCTION.

7-2. This chapter provides an illustrated parts list for the Oxygen Breathing Apparatus (OBA), P/N 449763, NSN 2H 4240-00-616-2857, manufactured by Mine Safety Appliances Company, Murrysville, Pa. 15668.

7-3. ARRANGEMENT. The complete OBA, shown in figure 1-1, is broken down into main parts and assemblies in figures 7-1 through 7-3. Each exploded view figure has a corresponding parts list. Parts are listed in an order of disassembly as shown by the index numbers on the exploded views and in the parts lists.

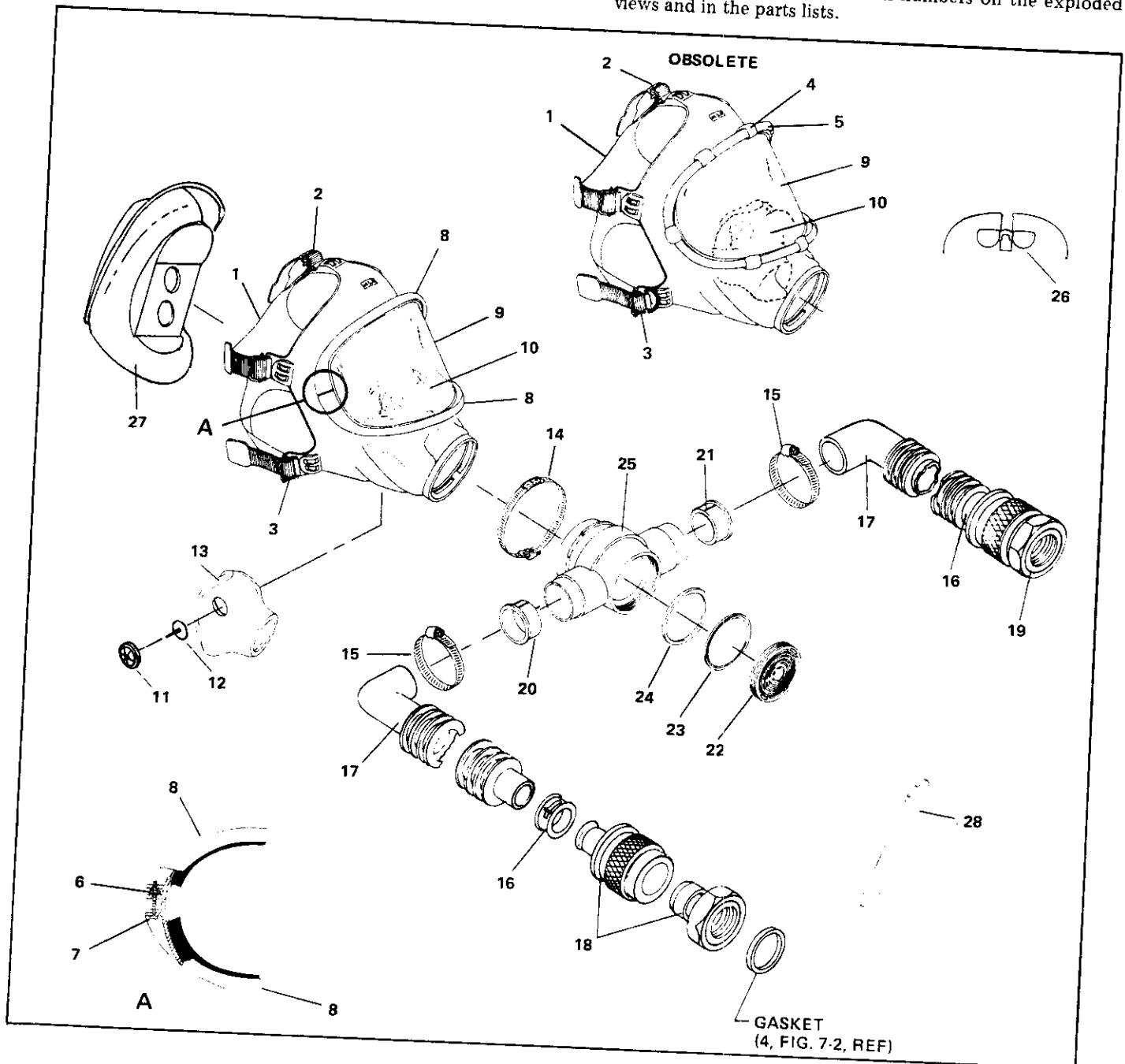


Figure 7-1. Ultravue Facepiece Assembly

FIGURE INDEX NO.	PART NUMBER	DESCRIPTION	UNITS PER ASSY
1-1	449763	BREATHING APPARATUS, Type A4 oxygen (See figures 7-1 and 7-2 for breakdown)	1
7-1	460735	FACEPIECE ASSY, Ultravue.	1
1	462548	HARNESS, Head.	1
2	96662	BUCKLE ASSY	3
3	457190	BUCKLE ASSY (With D ring)	2
4	96670	CLIP, Lens ring (Obsolete)	8
5	96678	RING, Lens (Replaced by 462709).	1
6	61765	NUT.	2
7	60532	SCREW.	2
8	462709	RING, Lens (Replaces 96678)	2
9	461985	LENS	1
10	96671	NOSE CUP ASSY	1
11	96659	SEAT, Valve.	2
12	96660	DISC, Valve	2
13	96676	NOSECUP.	1
14	628210	CLAMP.	1
15	62720	CLAMP, Hose.	2
16	57909	CLAMP, Hose.	2
17	79408	TUBE, Breathing.	2
18	460775	COUPLING ASSY, Exhalation (Black)	1
19	461751	COUPLING ASSY, Inhalation (Blue)	1
7-1	454777	VALVE ASSY, Combination.	1
20	454776	VALVE ASSY, Exhalation	1
21	454775	VALVE ASSY, Inhalation.	1
22	454783	CAP, Valve.	1
23	96668	DIAPHRAGM, Speaking.	1
24	83630	GASKET.	1
25	454780	BODY, Combination valve	1
26	454819	KIT, Spectacle (Optional, must be procured separately)	1
27	460737	SUPPORT, Facepiece.	1
28	455027	WRENCH (Optional)	1

7-4. All part numbers listed are those of Mine Safety Appliances Company (FSCM 55799).

7-5. The Description column of the lists is arranged to show the relation of parts to the complete OBA. Main parts and subassemblies are indented 1 column under the OBA listing. Parts of subassemblies which are broken down are indented 1 column under the subassembly listing. Similarly, parts of sub-subassemblies are indented 1 column under the sub-subassembly.

7-6. Quantities shown in the Units per Assy column, opposite the part description, are those used for the OBA, except for parts of a subassembly. Quantities given for detail parts of a subassembly or sub-subassembly are those required per subassembly or sub-subassembly. The total quantity of such parts needed for the OBA, therefore, would be the quantity of the detail part multiplied by the quantity of sub-subassembly and subassembly used per OBA.

7-7. The same attaching part used in different locations is identified with a symbol. A footnote with the same symbol explains where the part is used and gives the total quantity of that part used for the OBA. Different symbols are used for different part numbers.

7-8. ABBREVIATIONS. Abbreviations used in the parts lists are as follows:

Abbreviation	Meaning
AR	As required
ASSY	Assembly
Cd	Cadmium
Hex.	Hexagon
in.	Inch
ID	Inside diameter
NHA	Next higher assembly
Ni	Nickel
No.	Number
OD	Outside diameter
Ref	Reference; When present in the Units per Assy column, it indicates that the part has been listed previously.
SST	Stainless steel
UNC	Unified National Coarse
UNF	Unified National Fine

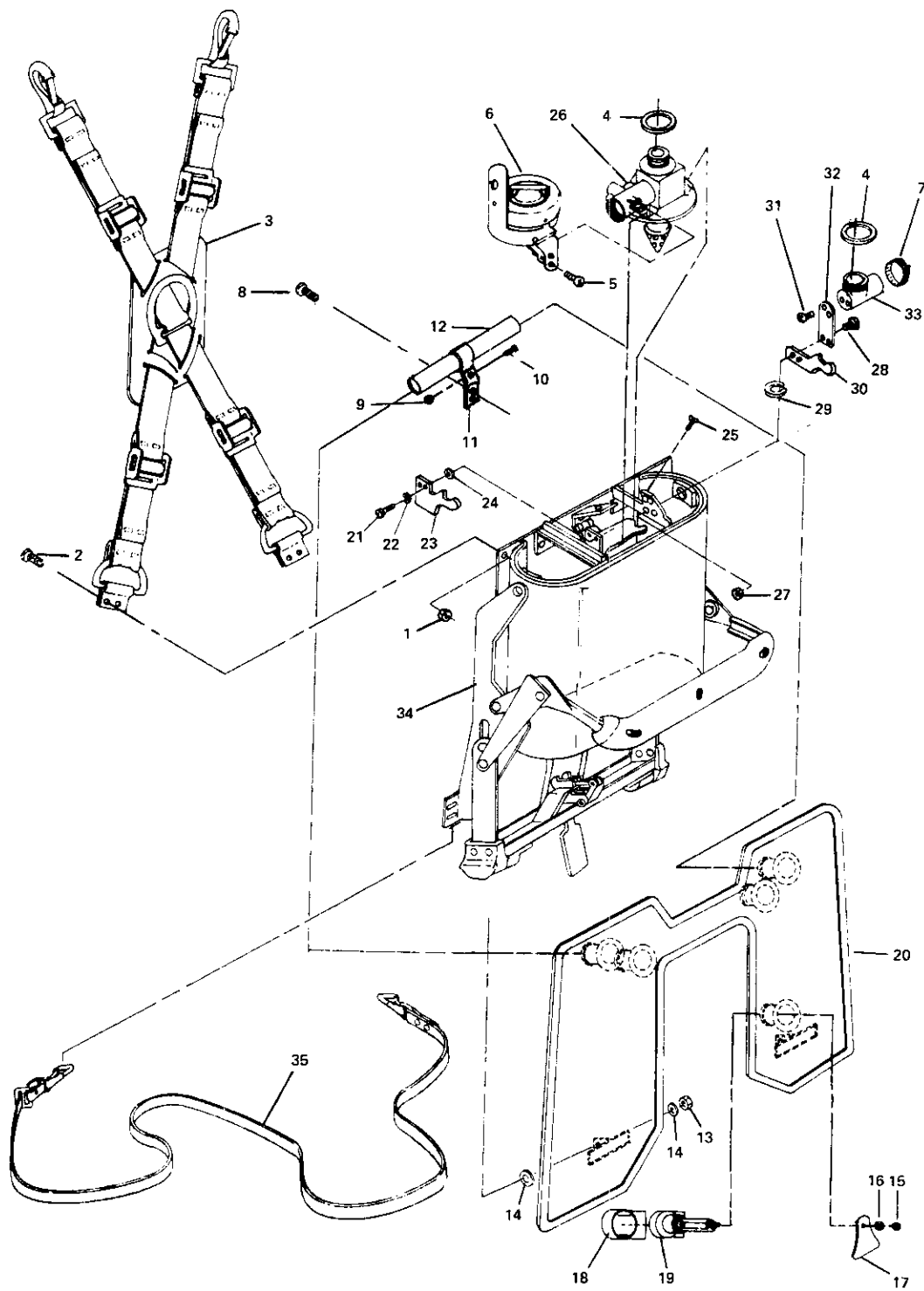


Figure 7-2. Type A-4 Oxygen Breathing Apparatus

FIGURE INDEX NO.	PART NUMBER	DESCRIPTION	UNITS PER ASSY
7-2			
1	*627851	NUT, Selflocking SST (18-8) No. 10-32 UNF-2B.	4
2	627901	SCREW, Slotted panhead SST (18-8) No. 10-32 UNF-2A x 3/8 in.	4
3	459425	HARNESS ASSY.	1
4	461955	GASKET.	2
5	66667	SCREW, Slotted pan head, steel Cd plated No. 10-24 UNC-2A x 1/4 in.	4
6	459428	TIMER ASSY.	1
7	57909	CLAMP.	4
8	+28182	SCREW, Slotted panhead SST (18-8) No. 10-24 UNC-2A x 3/8 in.	2
9	*627851	NUT, Selflocking SST (18-8) No. 10-32 UNF-2B.	1
10	#627902	SCREW, Slotted panhead SST (18-8) No. 10-32 UNF-2A x 5/8 in.	1
11	459504	BRACKET.	1
12	460650	TUBE.	1
13	*627851	NUT, Selflocking SST (18-8) No. 10-32 UNF-2B.	2
14	65134	WASHER, Flat SST (18-8) No. 10.	4
15	50447	NUT, Hex. cap brass Ni plated No. 8-32 (5/16 in. across flats x 9/32 in. thk)	1
16	65278	WASHER, Plain steel Cd plated No. 8 (3/16 ID x 7/16 OD x 0.036/0.065 in. thk)	1
17	460742	TAB, Pull.	1
18	460665	COVER, Valve.	1
19	460659	VALVE ASSY, Relief.	1
20	460667	BAG ASSY, Breathing (with valve).	1
21	+628182	SCREW, Slotted panhead SST (18-8) No. 10-24 UNC-2A x 3/8 in.	2
22	65134	WASHER, Flat SST (18-8) No. 10.	2
23	459422	CATCH, Right.	1
24	¢627852	LOCKWASHER, External tooth SST (18-8) No. 10.	2
25	627905	SCREW, Slotted panhead SST (18-8) No. 10-24 UNC-2A x 3/16 in.	2
26	74174	PLUNGER ASSY.	1
27	627851	NUT, Selflocking No. 10-32.	2
28	628160	SCREW, Cap SST (18-8) No. 10-32 UNF-2A x 5/8.	2
29	¢627852	LOCKWASHER, No. 10.	2
30	459423	CATCH, Left.	1
31	627904	SCREW, Slotted panhead SST (18-8) No. 8-32 UNC-2A x 1/4 in.	2
32	462920	BRACKET.	1
33	41838	ELBOW, Inhalation.	1
34	459510	BREASTPLATE ASSY (See figure 7-3 for breakdown).	1
35	459503	STRAP, Waist.	1
7-2	22350	TAPE, 1/2 inch wide.	AR
7-2	22351	TAPE, 1/4 inch wide.	AR
7-2	21794	WIRE, Binding.	AR

- * Also used for items 9 and 13, figure 7-2; total of 7 per OBA.
+ Also used for item 21, figure 7-2; total of 4 per OBA.
Also used for items 17 and 18, figure 7-3; total of 5 per OBA.
+ Also used for item 8, figure 7-2; total of 4 per OBA.
¢ Also used for item 29, figure 7-2; total of 4 per OBA.

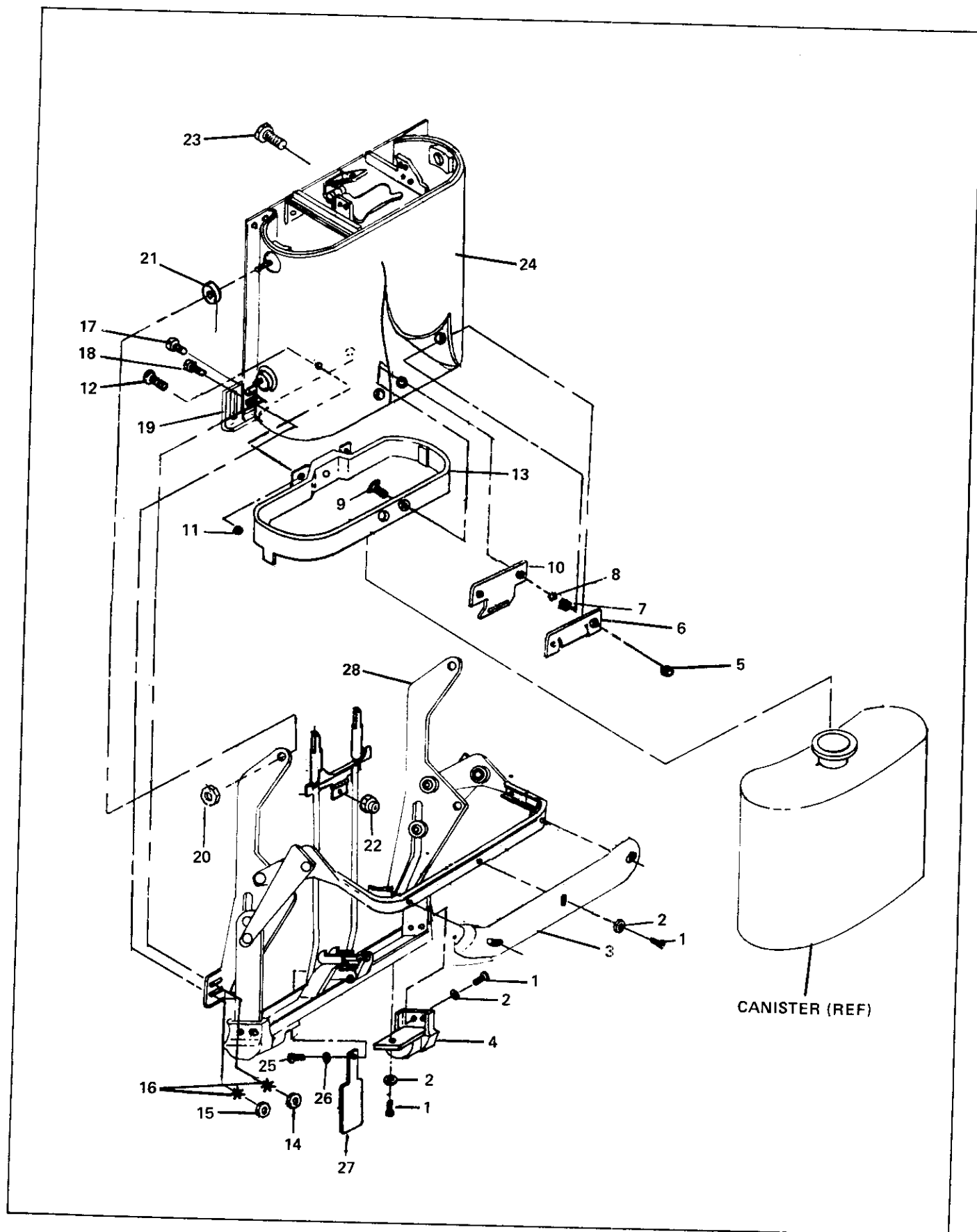


Figure 7-3. Breastplate Assembly

FIGURE INDEX NO.	PART NUMBER	DESCRIPTION	UNITS PER ASSY
7-3	459510	BREASTPLATE ASSY (See index 34, figure 7-2 for NHA)	REF
1	66691	. . . SCREW, Slotted SST panhead No. 6-32 UNC-2A x 3/8 in.	9
2	462725	. . . WASHER, Retaining	9
3	462727	. . . HANDLE, Shock absorber	1
4	462728	. . . BAIL, Shock absorber	2
5	627665	. . . NUT, Hex. cap SST (18-8) No. 8-32 (5/16 in. across flats x 9/32 in. thk)	2
6	449321	. . . SHIELD	1
7	627664	. . . NUT, Hex. double-chamfered SST (18-8) No. 8-32 UNC-2B	2
8	627663	. . . LOCKWASHER, External tooth SST (18-8) No. 8	2
9	627853	. . . SCREW, Hex. socket flat head SST (18-8) No. 8-32 UNC-3A x 3/4 in.	2
10	459421	. . . CATCH, Bottom	1
11	627900	. . . NUT, Hex. selflocking light duty SST (18-8) No. 8-32 UNC-2B	2
12	67067	. . . SCREW, Slotted panhead SST (18-8) No. 8-32 UNC-2A x 1/2 in.	2
13	449350	. . . GUIDE ASSY, Canister	1
14	60564	. . . NUT, Hex. double-chamfered SST (18-8) No. 10-32 UNF-2B	2
15	627851	. . . NUT, Selflocking SST (18-8) No. 10-32 UNF-2B	2
16	627852	. . . LOCKWASHER, External teeth SST (18-8) No. 10	4
17	#627902	. . . SCREW, Slotted pan head SST (18-8) No. 10-32 UNF-2A x 5/8 in.	2
18	#627902	. . . SCREW, Slotted panhead SST (18-8) No. 10-32 UNF-2A x 3/8 in.	2
19	459426	. . . BRACKET, Waist	1
20	627899	. . . NUT, Hex. selflocking heavy duty SST (18-8) 1/4-20 UNC-2B	4
21	459420	. . . SPACER	4
22	627900	. . . NUT, Hex selflocking light duty SST (18-8) No. 8-32 UNC-2B	1
23	66902	. . . SCREW, Slotted panhead SST (18-8) No. 8-32 UNC-2A x 3/8 in.	1
24	304350	. . . GUARD AND INSULATION ASSY	1
	No Number	. . . SYSTEM, Canister retaining	NP
25	627297	. . . SCREW, Hex. socket button head cap steel Cd plated No. 8-32 UNC-2A x 3/8 in.	1
26	627298	. . . WASHER, Plain steel Cd plated No. 8	1
27	460655	. . . TAB	1
28	459427	. . . SYSTEM, Retaining	1

Also used for item 10, figure 7-2; total of 5 per OBA.

CHAPTER 8

INSTALLATION

(Not Applicable)

(Use this report to indicate deficiencies, user remarks and recommendations relating to the publication. Fold on dotted line, staple, and mail to NAVAL SEA DATA SUPPORT ACTIVITY.)

REPORT DATE:

1. NAVSEA NO.	2. VOLUME NO.	3. TITLE (NOMENCLATURE)		
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	5. CART/FICHE NO.	6. CART/FICHE DATE	7. FRAME NO.	8. OTHER I.D. NO.
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PAGE NO.	PARA-GRAPH	LINE NO.	FIG. NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON (Use Blank Continuation Sheets as Required)

15. ORIGINATOR	16. RANK/RATE/TITLE
17. WORK CENTER	18. SUPERVISOR
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